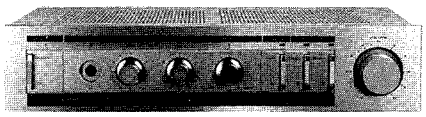
PIONEER®

Service Manual



ORDER NO.
ARP-480-0

STEREO AMPLIFIER

SA-301

MODEL SA-301 COMES IN SIX VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KC	AC120V only	Canada model
HE	AC220V, 240V (switchable)	European continent model
HB	AC220V, 240V (switchable)	United Kingdom model
S	AC110V, 120V, 220V, 240V (switchable)	General export model
YP	AC240V only	Australia model
HEZ	AC220V, 240V (switchable)	West Germaney model

■ **This service manual is applicable to the HE type. For servicing of the other types, please refer to the additional service manual.**

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1. SPECIFICATIONS

Amplifier Section

DIN Continuous Power Output at 1 kHz (both channels driven)
T.H.D. 1%, 8 ohms ..... 32 watts per channel
Frequency Response
PHONO (RIAA Equalization) ..... 30 Hz to 20,000 Hz ±0.5 dB
TUNER, TAPE ..... 10 Hz to 60,000 Hz ±3 dB
Input Level (T.H.D. 0.05%, 1 kHz)
PHONO ..... 140 mV
Output impedance
SPEAKER ..... 8 ~ 16 Ω
Hum and Noise (IHF, short circuited, A network)
PHONO ..... 72 dB
TUNER, TAPE PLAY ..... 97 dB
Hum and Noise (DIN, continuous power/50 mW)
PHONO ..... 66 dB/62 dB
TUNER, TAPE PLAY ..... 82 dB/64 dB

Miscellaneous

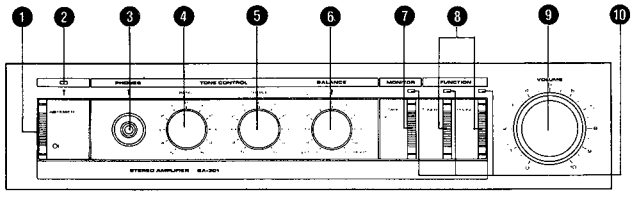
Power Requirements ..... a.c.220 Volts ~ 50/60 Hz
Power Consumption ..... 160 Watts
Dimensions ..... 420 (W) x 98 (H) x 234 (D) mm
16-9/16 (W) x 3-7/8 (H) x 9-3/16 (D) in
Weight (without package) ..... 3.9 kg (8 lb 10 oz)

Furnished Part

Operating Instructions 1

NOTE:
Specifications and design subject to possible modifications without notice due to improvements.

2. FRONT PANEL FACILITIES



❶ POWER SWITCH (POWER ◯|)

❷ POWER INDICATOR

❸ PHONES JACK

Use this jack for listening to the program source through your headphones. Connect the plug on the headphones properly to this jack. Once connected, no sound will be heard through the speakers.

NOTE:
Get into the habit of turning down the volume before plugging in the headphones. Loud sounds can damage your ears.

❹ BASS CONTROL

This is used to adjust the bass (low-frequency) sound.

❺ TREBLE CONTROL

This is used to adjust the treble (high-frequency) sound.

❻ BALANCE CONTROL

This control should normally be set to the center position, when the output from the left and right speakers or headphones is not the same, adjust by turning the control clockwise or counterclockwise.

❼ TAPE/MONITOR SWITCH (MONITOR)

Set this switch to ON when using a tape deck or a graphic equalizer (or any equipment) connected to the TAPE/MONITOR terminals.

❽ FUNCTION SWITCH

This is used to select the program source which is to be heard.
PHONO: For playing records on the turntable connected to the PHONO terminals.
TUNER: For listening to broadcasts on a tuner connected to the TUNER terminals.

❾ VOLUME CONTROL

This is used to adjust the volume of the speakers and headphones.

❿ INDICATORS (FUNCTION and MONITOR)

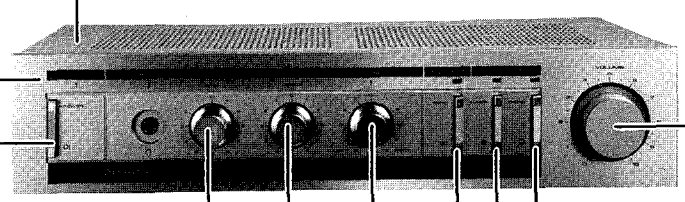
The indicator corresponding to the selected function switch or TAPE/MONITOR switch lights.

3. PARTS LOCATION

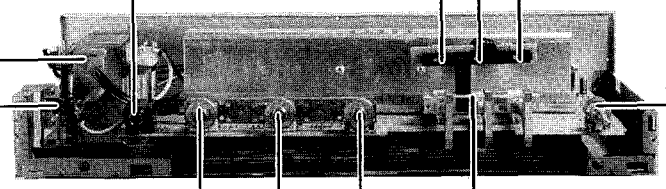
NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

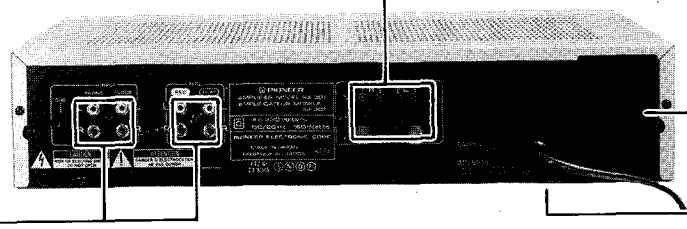
Front Panel View



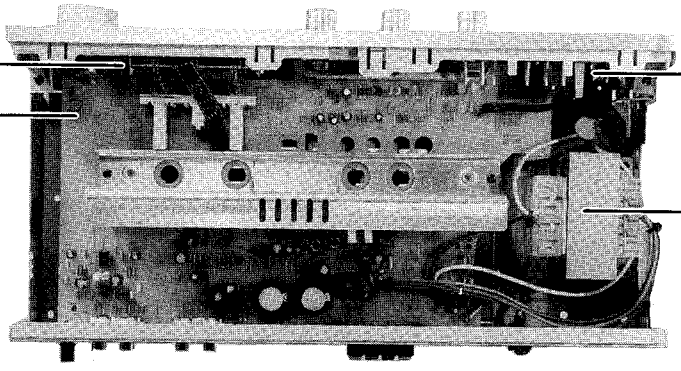
Front View with Panel View



Rear Panel View



Top View



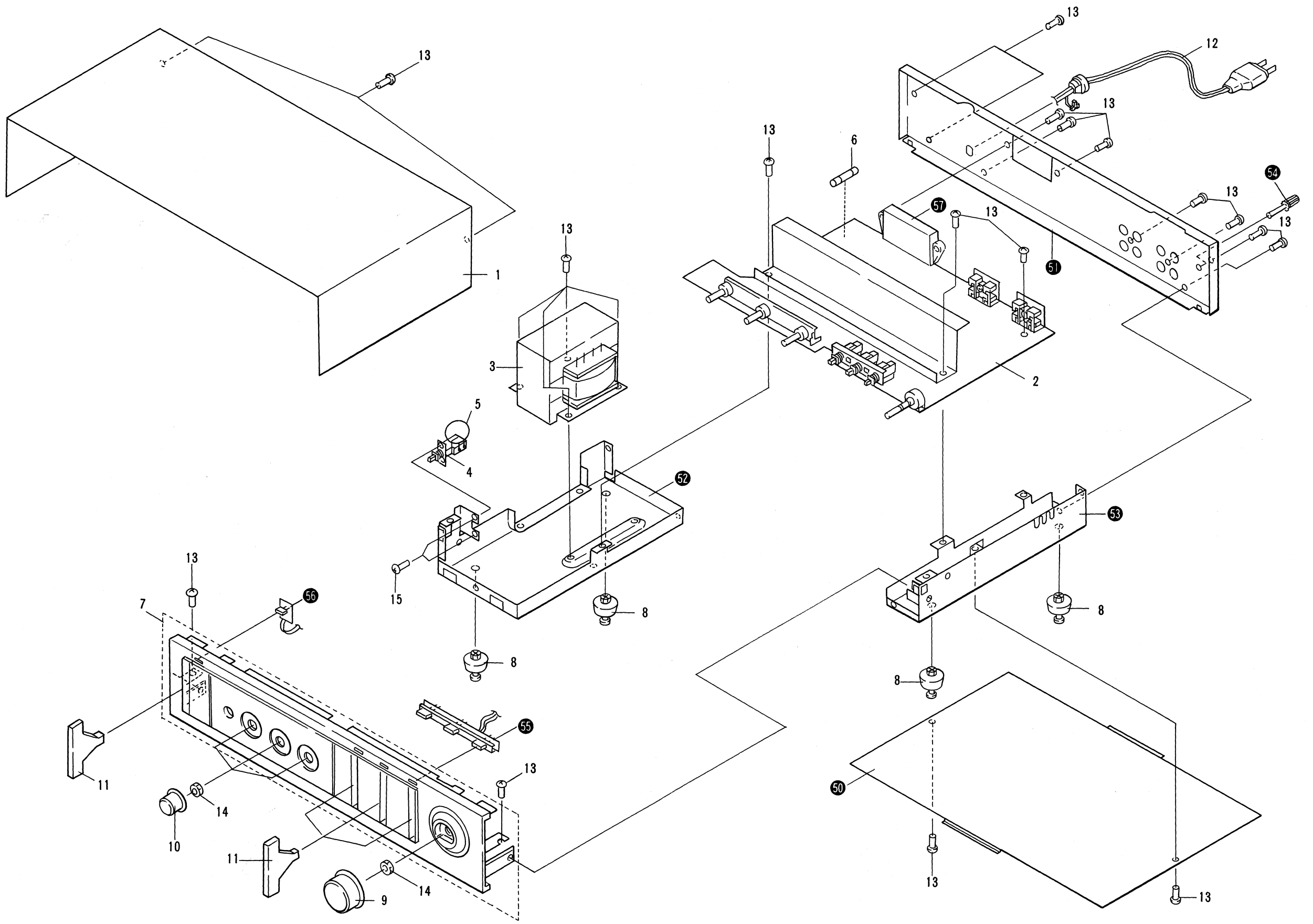
4. EXPLODED VIEW

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ *GENERALLY MOVES FASTER THAN* ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Parts List

Mark	No.	Part No.	Description
	1.	ANE-472	Bonnet case
	2.	GWK-241	AF Assembly
⚠★	3.	ATS-100	Power transformer
⚠★★	4.	ASG-541	Push switch (S3, POWER)
⚠	5.	ACG-502	Ceramic capacitor (0.01/AC400V)
⚠★★	6.	AEK-031	Fuse (FU3, T800mA)
	7.	ANM-539	Front panel assembly
	8.	AEP-007	Leg assembly
	9.	AAB-361	Rotary knob L (VOLUME)
	10.	AAB-362	Rotary knob S (TRABLE, BASS, BALANCE)
	11.	AAD-787	Push knob
⚠	12.	ADG-068	AC Power cord
	13.	BBZ30P080FZK	Screw 3x8
	14.	NK90FUC	Nut
	15.	VMZ30P060FMC	Screw 3x6
	50.		Bottom plate
	51.		Rear panel
	52.		Transformer frame
	53.		Right frame
	54.		Terminal (GND)
	55.		Function IND assembly
	56.		Power IND assembly
	57.		Terminal 4P (SPEAKER)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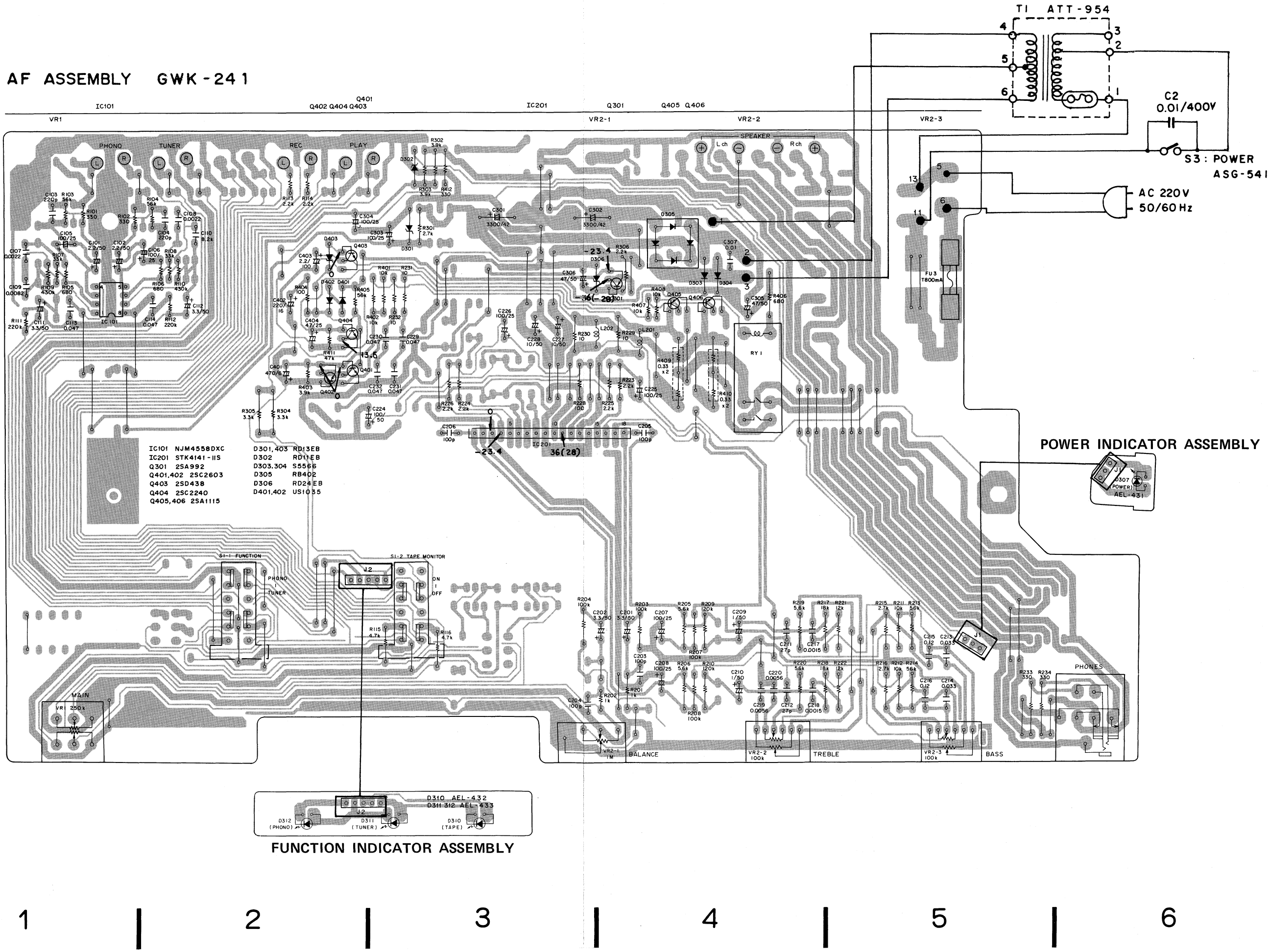
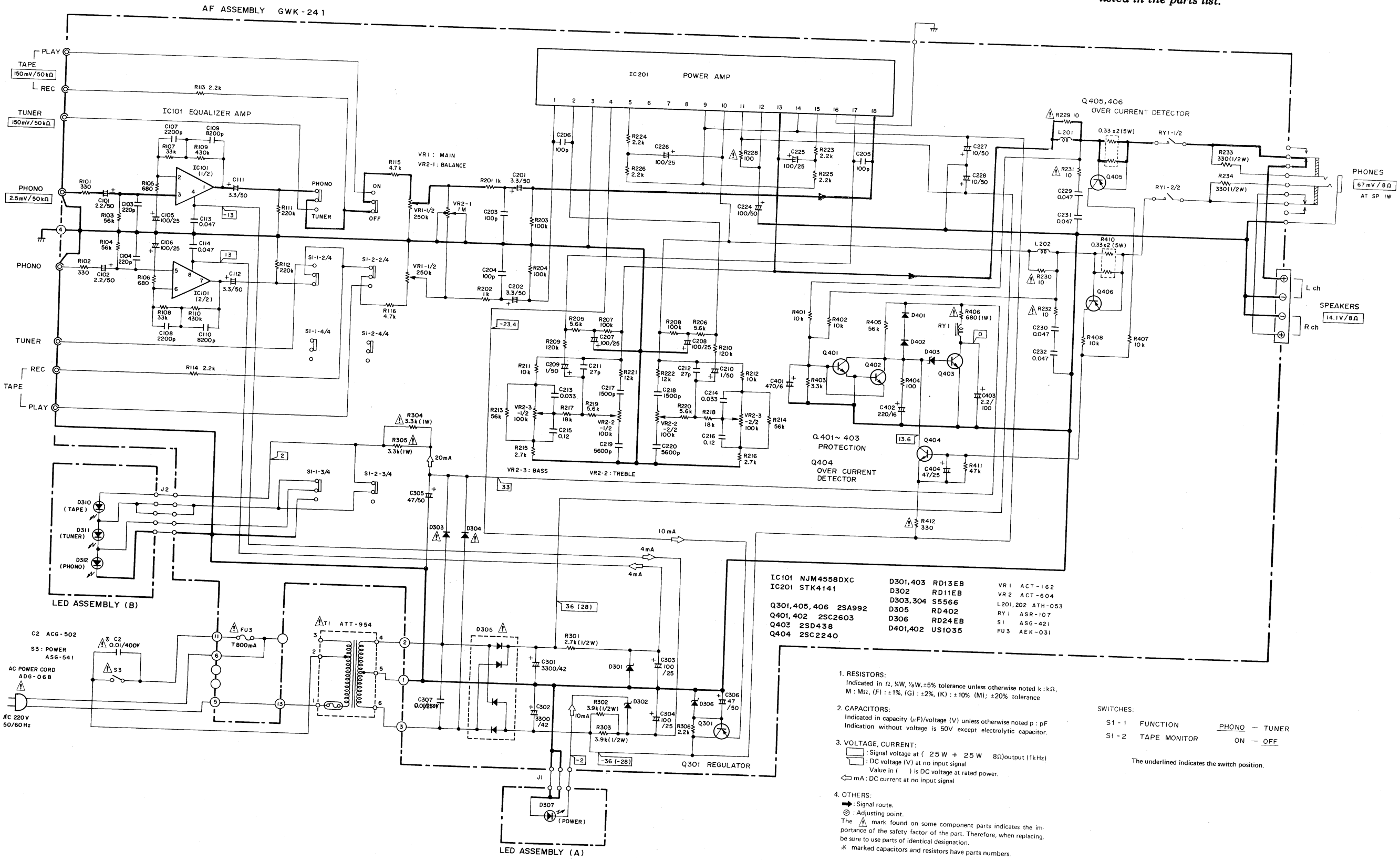
5. P.C.BOARDS CONNECTION DIAGRAM



6. SCHEMATIC DIAGRAM

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



IC101 NJM4558DXC
IC201 STK4141

Q301,405,406 2SA992
Q401,402 2SC2603
Q402 2SD438
Q404 2SC2240

D301,403 RD13EB
D302 RD11EB
D303,304 S5566
D305 RD402
D306 RD24EB
D401,402 US1035

VR1 ACT-162
VR2 ACT-604
L201,202 ATH-053
RY1 ASR-107
S1 ASG-421
FU3 AEK-031

1. RESISTORS:
Indicated in Ω, ¼W, ⅛W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% (M); ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:
: Signal voltage at (25W + 25W 8Ω)output (1kHz)
: DC voltage (V) at no input signal
Value in ( ) is DC voltage at rated power.
⇦ mA : DC current at no input signal

4. OTHERS:
➡ : Signal route.
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCHES:

S1-1	FUNCTION	PHONO — TUNER
S1-2	TAPE MONITOR	ON — OFF

The underlined indicates the switch position.

7. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56 x 10¹*	*561*	*RD¼PS 5 6 1 J*
47kΩ	*47 x 10³*	*473*	*RD¼PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 x 10¹*	*5621*	*RN¼SR 5 6 2 1 F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number , temperature, humidity, etc.

Miscellaneous Parts

Mark	Symbol & Description	Part No.
	AF Assembly	GWK-241
	Power indicator assembly	
	Function indicator assembly	
⚠	C2 Ceramic capacitor (0.01/400V)	ACG-502
⚠ ★	T1 Power transformer	ATS-100 (ATT-954)
⚠ ★★	S3 Push switch (POWER)	ASG-541 (ASG-539)
⚠ ★★	FU3 Fuse (T800mA)	AEK-031

OTHERS

Mark	Symbol & Description	Part No.
⚠	C2 Ceramic capacitor (0.01/400V)	ACG-502
⚠ ★	T1 Power transformer	ATS-100 (ATT-954)
⚠ ★★	S3 Push switch (POWER)	ASG-541 (ASG-539)
⚠ ★★	FU3 Fuse (T800mA)	AEK-031

AF Assembly (GWK-244)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC101 OP-AMP IC	NJM4558DXC
★★	IC201 AUDIO IC	STK4141-2S
★★	Q405, Q406	2SA992 (2SA970)
★★	Q301	2SA992
★★	Q401, Q402	2SC2603 (2SC2458)
★★	Q403	2SD438
★★	Q404	2SC2240
★	D305	RB402
★	D302	RD11EB (HZ11EB)
★	D301, D403	RD13EB (HZ13EB)
★	D306	RD24EB
★	D303, D304	S5566
★	D401, D402	US1035 (1S1555)

SWITCHES, RELAY

Mark	Symbol & Description	Part No.
★★	S1 Push switch (FUNCTION)	ASG-421
★★	RY1 Relay	ASR-107

COILS

Mark	Symbol & Description	Part No.
	L201, L202	ATH-053

CAPACITORS

Mark	Symbol & Description	Part No.
	C307 (0.01/AC250V)	ACG-019
	C301, C302 (3300/42)	ACH-249
	C203 – C206	CCDSL 101J 50
	C103, C104	CCDSL 221J 50
	C221, C212	CCDSL 270J 50
	C209, C210	CEA 010M 50L
	C227, C228	CEA 100M 50L
	C225, C226, C303, C304	CEA 101M 25L
	C224	CEA 101M 50L
	C403	CEA 2R2M 100L
	C402	CEA 221M 16L
	C111, C112	CEA 3R3M 50L
	C404	CEA 470M 25L
	C305, C306	CEA 470M 50L
	C401	CEA 471M 6L
	C105, C106, C207, C208	CEXA 101M 25
	C101, C102	CEXA 2R2M 50
	C101, C202	CEXA 3R3M 50
	C113, C114, C229 – C232	CKDYX 473M 25
	C215, C216	CQMA 124K 50
	C217, C218	CQMA 152K 50
	C107, C108	CQMA 222K 50
	C213, C214	CQMA 333K 50
	C219, C220	CQMA 562K 50
	C109, C110	CQMA 822K 50

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	R409, R410 (0.33/5W)	ACN-139
★	VR1 Variable resistor (MAIN)	ACT-162
★	VR2 Variable resistor (BALANCE, TREBLE, BASS)	ACT-604
⚠	R304, R305	RS1PMF332J
⚠	R406	RS1PMF681J
	R301, R233, R234, R302, R303	RD1/2PM □□□J
⚠	R228 – R230, R412	RD1/4PMFL331J
	R223 – R226	RD1/4PM □□□J
⚠	R231, R232	RD1/4PMF100J
	Other resistors	RD1/8PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
	Pin jack (4P)	AKB-094
	Terminal 4P (SPEAKERS)	
	Headphone jack	AKN-057
	Rivet	AEC-940
	Screw (Power transistor)	ABA-271
	Fuse holder	
	Terminal (GND)	
	LED Holder	
	Heat shink	

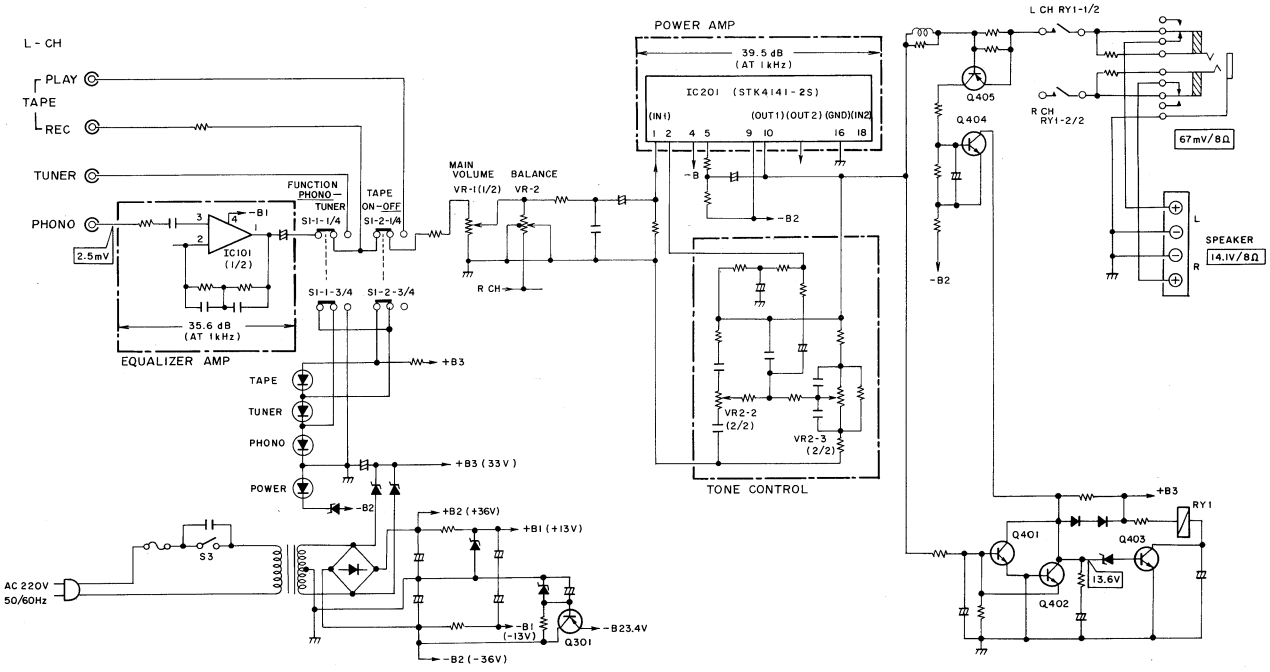
Function IND Assembly

Mark	Symbol & Description	Part No.
★	D310 LED (TAPE)	AEL-432
★	D311, D312 LED (TUNER, PHONO)	AEL-433

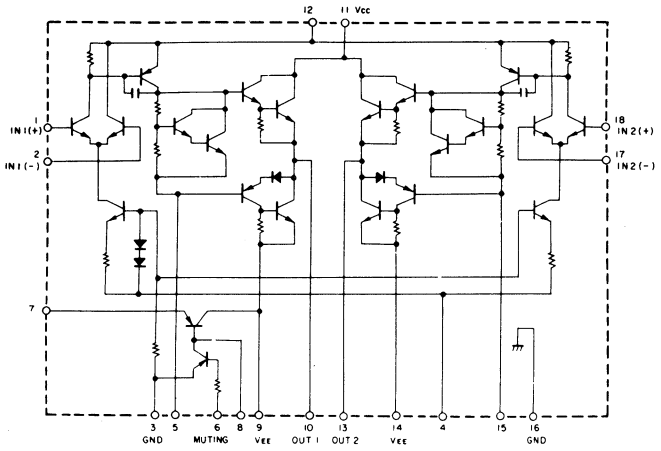
Power IND Assembly

Mark	Symbol & Description	Part No.
★	D307 LED (POWER)	AEL-431

8. BLOCK DIAGRAM



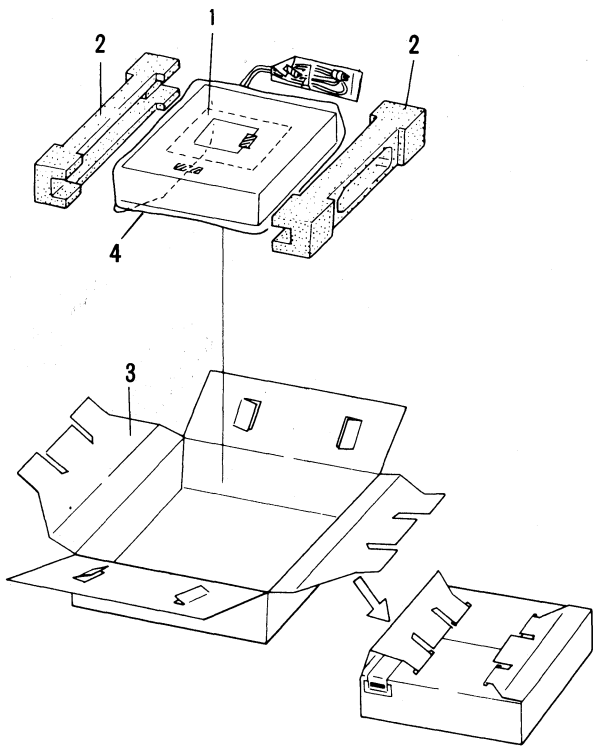
STK4141-2S Block diaglam



9. PACKING

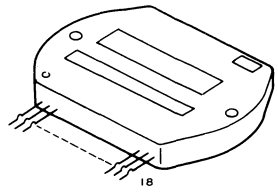
Parts List

Mark	No.	Part No.	Description
	1.	ARE-097	Operating instructions (English/French/German/Italian)
	2.	AHA-375	Side pad
	3.	AHE-309	Packing case
	4.		Sheet

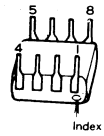


External Appearance of Transistors and ICs

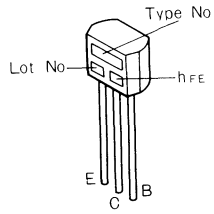
STK4141-2S



NJM4558DXC



2SC2603



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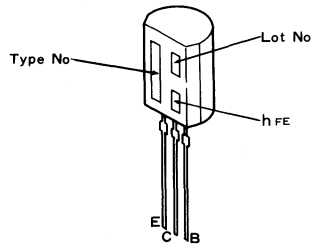
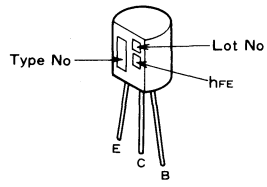
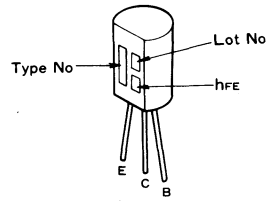


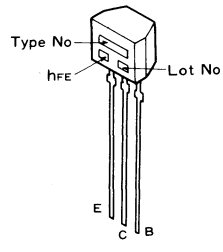
2SC2240
2SA970



2SA992



2SA1048
2SC2458



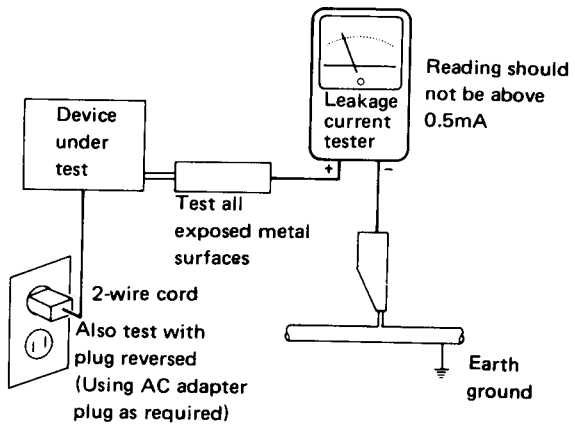
10. SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Device under test
Leakage current tester
Reading should not be above 0.5mA
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

QUESTIONNAIRE

MODEL _____
One Model per questionnaire

Dear Servicer,

Thank you for your cooperation in the post-sale service of Pioneer products.

This questionnaire is used as a tool to improve the serviceability of our products and service manuals. Please evaluate this model and service manual by answering the following questions. Your ideas may be realized in our future products. Your answers will be appreciated. Thank you.

PIONEER ELECTRONIC CORP.

T. Nakagawa, Manager, Service Section, International Division

1. SERVICING EVALUATION	Circle applicable number:	Good		Fair		Poor
a. Disassembly/Re-assembly:		1	2	3	*4	*5
b. Circuit Checks:		1	2	3	*4	*5
c. Replacement of Parts:		1	2	3	*4	*5
d. Adjustment (s):		1	2	3	*4	*5

* If (4) or (5) was circled, please be specific.

e. Your advice, opinion or ideas related to servicing this product.

2. SERVICE MANUAL EVALUATION

a. Circuit & Mechanism Description

b. Circuit Diagram

3. OTHER

Please describe other areas of servicing which you may find difficult.

Completed by : Date :

Company Name :

Address :

City/State/Zip :

Please send this form filled to the distributor in your country.

QUESTIONNAIRE

Modèle _____
Un modèle par questionnaire

Cher Monsieur,

Merci pour votre coopération à propos du service après-vente des produits PIONEER.

Ce questionnaire a pour but l'amélioration de notre service d'entretien et des manuels de nos produits. Nous vous prions d'évaluer dans ce questionnaire les éléments de nos manuels de service. Vos conseils seront précieux et pris en considération dans la réalisation de nos produits dans l'avenir.
En vous remerciant d'avance, agréez, cher monsieur, l'expression de nos sentiments distingués.

PIONEER ELECTRONIC CORPORATION

T. Nakagawa, Manager, Service Section, Administration Department, International Division

1. ÉVALUATION EN FACILITÉ DE SERVICE MODÈLE	Cerclez le numéro. Bon,		Passable,		Mauvais,
a. Démontage/remontage	1	2	3	*4	*5
b. Examen de circuits	1	2	3	*4	*5
c. Rechange de pièces	1	2	3	*4	*5
d. Facilité de réglage	1	2	3	*4	*5

* Si vous cerclez No. 4 ou 5, donnez l'explication concrète.

e. Votre conseil ou avis sur le service

2. VOTRE APPRÉCIATION DU MANUEL DE SERVICE

a. Circuit et description du mécanisme.

b. Diagramme du circuit.

3. AUTRES

Anotez les autres points difficiles à réparer.

Répondu par : Date :

Nom : Âge :

Compagnie :

Adresse :

Adressez-vous ce questionnaire au distributeur, S.V.P.

ENCUESTA

Modelo_____
Uno modelo por encuesta

Querido señor,

Muchas gracias por su cooperación en el servicio de post-venta de los productos de Pioneer. Esto es para mejorar el servicio de post-venta de nuestros productos. Les pedimos a ustedes responder a las preguntas siguientes. Su opinión e idea estarán tenido en cuenta en los productos futuros.

Nos complacemos en saludarles muy atentamente,

PIONEER ELECTRONIC CORPORATION

T. Nakagawa, Manager, Service Section, Administration Department, International Division

1. EVALUACION EN LA FACILIDAD DE SERVICIO

MODELO

Marque uno entre los numeros siguientes.

	Bueno		Medio		Malo
a. Desmonte:	1	2	3	*4	*5
b. Examen de circuito:	1	2	3	*4	*5
c. Reemplazo de piezas:	1	2	3	*4	*5
d. Ajuste:	1	2	3	*4	*5

* Si marca (4) o (5), ejemplifiquelo concretamente.

e. Su consejo, opinión u idea en el servicio de este modelo.

2. EVALUACION DEL MANUAL DE SERVICIO

a. Circuito & Descripción de mecanismos.

b. Diagrama del circuito.

3. OTRAS

Describe otras partes dificiles de reparar.

Respondido por : Fecha :

Nombre : Edad :

Compañía :

Dirección :

Manda esta enquesta al domicilio del distribuidor, por favor.